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MODELING CARDIOVASCULAR HEALTH OUTCOMES IN MEDICAID HYPERTENSIVE PATIENTS—EFFECT OF PATIENT ADHERENCE

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OBJECTIVES: The extent to which adherence to anti-hypertensive medications may affect risk of having new cardiovascular events remains unclear, in part due to the methodological complexity in measuring adherence. We sought to determine the relationship between anti-hypertensive drug adherence and cardiovascular health outcomes in a Medicaid, high risk population. **METHODS:** The study is composed of continuously enrolled patients in a Mid-Atlantic Medicaid Managed Care program between July 1, 2002 and June 30, 2005, with at least three prescriptions of anti-hypertensive medications and no such prescription during the preceding six months. Adherence to anti-hypertensive medications was first measured as a time weighted average of Cumulative Medication Acquisition (CMA) and then as Medication Possession Ratio (MPR), with weight being the length of therapeutic period of each drug class. We used Cox proportional hazard models to assess the impact of adherence on events of interest, adjusting for sociodemographic and clinical characteristics. **RESULTS:** A total of 7939 patients qualified for the study and 140 cardiovascular events were observed after six months post index date. For the CMA model, we found every 10% increase in CMA score decreased the hazard of having cardiovascular events by approximately 14% and similar trend was observed in the MPR model. Both of the effects were significant at $P = 0.05$ level. We also conducted sensitivity analyses by altering washout-out period to three months and similar results were observed. To disentangle the possible "healthy adherer" effect, we investigated the relationship between CMA and risk of hospitalization for Lung Cancer, HIV/AIDS, or Peptic Ulcer and found no association between adherence and specified health outcomes. **CONCLUSIONS:** In this Medicaid population, a lower risk of cardiovascular events associated with improved drug adherence was observed. Adherence outcome benefits are likely to be mediated by drug effects and do not merely reflect a "healthy adherer" behavior attributes.

PCV59

THE COST AND EFFECTIVENESS OF ADHERENCE-IMPROVING INTERVENTIONS FOR LIPID-LOWERING AND ANTIHYPERTENSIVE DRUGS

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OBJECTIVE: Adherence to cardiovascular (CV) medications is poor. Studies that investigate interventions to improve adherence rarely consider the costs of these programs. We assessed the effectiveness and costs of different adherence-improving interventions for CV drugs. **METHODS:** We reviewed MEDLINE to update a published literature review of interventions to improve adherence to lipid-lowering and/or antihypertensive therapy. The prior review covered January 1972–June 2002; this review covered July 2002–October 2007. Search terms included hypertension, hyperlipidemia, antihypertensive agents, antilipidemic agents, patient compliance, intervention studies and reminder system. Eligible studies evaluated at least one adherence intervention, compared an intervention to control, used an adherence measure other than self-report, and followed patients for >=6 months. Interventions were classified as dosing modifications, patient education, case management, reminders, other interventions, or combinations. Effectiveness was calculated as the ratio of adherence in the intervention group to the control group. Costs were based on those reported in the analysis, where available, or estimated based on resource use described in the article. All costs were standardized to 6 months and adjusted to 2006 dollars using the medical component of the CPI. **RESULTS:** We identified 755 new articles, 5 of which met all eligibility criteria; when combined with the prior review, there were a total of 23 interventions from 14 studies. Relative improvement (RI) in adherence ranged from 1.11 to 4.65. Six month intervention costs ranged from $9.59 to $142.22 per patient. Reminders tended to have the lowest effectiveness (RI: 1.11–1.14), but were the least costly ($9.59/6 months). Case management was the most effective (RI: 1.23–4.65), but more costly than other interventions ($89.90–$129.78/6 months). **CONCLUSION:** In general, there was a positive association between the cost of the intervention and its effectiveness at improving adherence. Understanding the costs and benefits of adherence interventions may guide design and implementation of efficient adherence-improving programs.

PCV60

USING A LONGITUDINAL MODEL TO ANALYZE DRUG COMPLIANCE

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To describe a measure of drug compliance on each patient at multiple time points, and illustrate an approach for quantifying the impact of covariates on these longitudinal compliance measurements. Nine thousand hypertensive patients from MEDSTAT's Marketscan database were identified who filled an antihypertensive drug 5 times in 2006. At each fill, days since expiration of previous fill's days supply (gap) was measured, a smaller gap suggesting better compliance. Also measured were covariates such as demographics, co-medication, and co-pay. A random effect model was used to describe the dependence of the five gap compliance measurements on each patient, with a random intercept reflecting the impact of both measured and unmeasured covariates. Patient specific slopes were used to reflect relationships between gap and covariates. The average gap was 5 days and the fraction of total gap variance due to heterogeneity across patients was 27%. The gap within patients increased on average over time (0.5 day increase in gap size per month) but this varied considerably between patients (SD = 0.8). The gap was larger for diuretic than for non-diuretic drug users, decreased slightly with age, and was not associated with co-pay. Unlike single measures of compliance, longitudinal measures provide opportunity to describe patterns over time within patients, and permit impact of changing covariates within patients to be estimated.

PCV61

IMPACT OF PRESCRIPTION COPAY ON ADHERENCE WITH RENIN-ANGIOTENSIN SYSTEM AGENTS IN HEART FAILURE PATIENTS

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OBJECTIVE: The purpose of the study was to investigate the relationship between prescription copay and adherence with renin-angiotensin system (RAS) therapy in heart failure patients. **METHODS:** Data for this study came from a large national pharmacy benefit manager's clients. A retrospective data analysis was used to identify patients who had a diagnosis of heart failure (ICD-9 code 428) between July 1, 2003 and June 30, 2006. The discharge date of the first hospitalization after the 6-month base-